### 4.2.7.9 Public and Occupational Health and Safety

Assessments have been made of potential radiological and chemical impacts associated with the No Action Alternative at RFETS. A discussion of reduced impacts associated with the phaseout of existing Pu storage is also presented. Summaries of radiological impacts from normal operations are presented in Tables 4.2.7.9–1 and 4.2.7.9–2 for the public and workers, respectively. Impacts from hazardous chemicals are presented in Table 4.2.7.9–3. Impacts associated with postulated accidents are addressed in this section.

**No Action Alternative**

This section describes the radiological and hazardous chemical releases and their associated impacts resulting from either normal operation or accidents involved with the current sitewide mission including interim storage of Pu at RFETS. The section describes the impacts from normal operation, then describes the potential risks of impacts from facility accidents.

The impacts on the public and on workers under the No Action Alternative during normal operation at RFETS would be within applicable regulatory limits.

**Normal Operation.** The current mission at RFETS, where Pu is in interim storage, is described in Section 3.8. The site has identified those facilities that will continue to operate under the No Action Alternative, including interim Pu storage facilities. Radiological and chemical impacts on the public and workers at RFETS are described below.

*Radiological Impacts.* The calculated annual dose to the average and maximally exposed members of the public, the associated fatal cancer risks to these individuals from 50 years of total site operation, the dose to the population within 80 km (50 mi) from total site operation in the year 2030, and the projected number of fatal cancers in this population from 50 years of operation are presented in Table 4.2.7.9–1 under this alternative at RFETS. The annual dose of 0.48 mrem to the MEI is within the radiological limits specified in NESHAPS (40 CFR 61, Subpart H) and DOE Order 5400.5. The annual dose of 0.10 person-rem to the population is within the proposed reporting limit. To put operational dose impacts into perspective, comparisons with doses from natural background radiation are included in the table.

The average annual dose to a site worker and the associated risk of fatal cancer from 50 years of total site operations, and the annual dose to the total site workforce and the projected number of fatal cancers from 50 years of total site operations, are presented in Table 4.2.7.9–2 for the No Action Alternative at RFETS.

*Hazardous Chemical Impacts.* Hazardous chemical impacts on the public resulting from the normal operation under No Action at RFETS are presented in Table 4.2.7.9–3. The noncancerous health effects expected and the risk of cancer due to the total chemical exposures, must be estimated for each site. Since the major releases due to normal operation at RFETS would make up nearly all of the exposures to onsite workers and to the public in adjacent communities, contributions to the hazardous chemical concentrations from all other sources, for example, industrial operations, are considered negligible for purposes of risk calculations.

The HI for the MEI of the public at RFETS resulting from normal operation under the No Action Alternative is $1.2 \times 10^{-3}$, and the cancer risk is $2.1 \times 10^{-8}$. The HI to the onsite worker is $1.3 \times 10^{-2}$, and the cancer risk is $2.3 \times 10^{-6}$.

***Table 4.2.7.9–1. Potential Radiological Impacts to the Public During Normal Operation at Rocky Flats Environmental Technology Site—No Action***

| Receptor | No Action |
|---|---|
| **Annual Dose to the Maximally Exposed Individual Member of the Public[a]** | |
| Atmospheric release pathway (mrem) | 0.13 |
| Drinking water pathway (mrem) | 0.35 |
| Total liquid release pathway (mrem) | 0.35 |
| Atmospheric and liquid release pathways combined (mrem) | 0.48 |
| Percent of natural background[b] | 0.14 |
| 50-year fatal cancer risk | $1.2 \times 10^{-5}$ |
| **Population Dose Within 80 Kilometers for Year 2030[c]** | |
| Atmospheric release pathways (person-rem) | 0.10 |
| Total liquid release pathways (person-rem) | 0 |
| Atmospheric and liquid release pathway combined (person-rem) | 0.10 |
| Percent of natural background[b] | $9.1 \times 10^{-6}$ |
| 50-year fatal cancers | $2.5 \times 10^{-3}$ |
| **Annual Dose to the Average Individual Within 80 Kilometers[d]** | |
| Atmospheric and liquid release pathways combined (mrem) | $3.2 \times 10^{-5}$ |
| 50-year fatal cancer risk | $8.0 \times 10^{-10}$ |

[a] The applicable radiological limits for an individual member of the public from site operations are 10 mrem per year from the air pathways, as required by NESHAPS (40 CFR 61, Subpart H) under the CAA; 4 mrem per year from the drinking water pathway as required by the SDWA; and 100 mrem per year from all pathway combined. Refer to DOE Order 5400.5.

[b] The annual natural background radiation level at RFETS is 353 mrem for the average individual; the population within 80 km in the year 2030 receives $1.1 \times 10^{6}$ person-rem.

[c] For DOE activities, proposed 10 CFR 834 (see 58 FR 16268) would generally limit the potential annual population dose to 100 person-rem from all pathways combined, and would require an ALARA program.

[Text deleted.]

[d] Obtained by dividing the population dose by the number of people projected to live within 80 km of the site in 2030 (3,116,000).

Note: It is assumed that these doses will not be exceeded in the future since no additional activities are planned at the RFETS under the No Action Alternative.

Source: RFETS 1994a.

*Table 4.2.7.9–2. Potential Radiological Impacts to Workers During Normal Operation at Rocky Flats Environmental Technology Site—No Action*

| Receptor | No Action |
|---|---|
| **Involved Workforce**[a] | |
| Average worker dose (mrem/yr)[b] | 250 |
| 50-year risk of fatal cancer | $5.0x10^{-3}$ |
| Total dose (person-rem/yr) | 25 |
| 50-year fatal cancers | 0.50 |
| **Noninvolved Workforce**[c] | |
| Average worker dose (mrem/yr)[b] | 122 |
| 50-year risk of fatal cancer | $2.4x10^{-3}$ |
| Total dose (person-rem/yr) | 775 |
| 50-year fatal cancers | 15 |
| **Total Site Workforce**[d] | |
| Dose (person-rem/yr) | 800 |
| 50-year fatal cancers | 16 |

[a] The involved worker is a worker associated with operations of interim Pu storage. It is assumed that there are 100 workers, badged with dosimeters to monitor radiation exposure, with a conservatively estimated average dose of 250 mrem/yr per worker. However, an effective ALARA program will ensure that the exposure will be reduced to that level which is as low as reasonably achievable.

[b] The radiological limit for an individual worker is 5,000 mrem/year (10 CFR 835). However, DOE has also established an administrative control level of 2,000 mrem/yr (DOE1992t); the site must make reasonable attempts to maintain doses below this level.

[c] The noninvolved worker is a worker onsite but not associated with interim Pu storage operations. The projected number of noninvolved badged workers in 2005 is 6,350.

[d] The impact to the total workforce is the summation of the involved worker impact and the noninvolved worker impact.

[Text deleted.]

Source: DOE 1993n:7.

*Table 4.2.7.9–3. Potential Hazardous Chemical Impacts to the Public and Workers During Normal Operation at Rocky Flats Environmental Technology Site—No Action*

| Receptor | Total Site[a] |
|---|---|
| **Maximally Exposed Individual (Public)** | |
| Hazard Index[b] | $1.2x10^{-3}$ |
| Cancer risk[c] | $2.1x10^{-8}$ |
| **Worker Onsite** | |
| Hazard Index[d] | $1.3x10^{-2}$ |
| Cancer risk[e] | $2.3x10^{-6}$ |

[a] Total=The No Action contributions.

[b] Hazard Index for MEI: sum of individual Hazard Quotients (noncancerous health effects) for MEI.

[c] Cancer risk for MEI=(emissions for 8-hr) x (0.286 [converts concentrations to doses]) x (slope factor [SF]).

[d] Hazard Index for workers: sum of individual Hazard Quotients (noncancerous health effects) for workers.

[e] Cancer risk for workers= (emissions for 8-hr) x (0.286 [converts concentrations to doses]) x (0.237[fraction of year exposed]) x (0.571 [fraction of lifetime working]) x (SF).

Source: Section M.3, Table M.3.4-26.

**Facility Accidents.** Under the No Action Alternative, Pu would continue to be stored at the site in existing facilities. These facilities currently operate in accordance with DOE Orders which ensure that the risk to the public of prompt fatalities due to accidents or cancer fatalities due to operations will be in accordance with the DOE safety goals. The safety to workers and the public from accidents at existing facilities is also controlled by technical safety requirements specified in detail in a SAR or Basis for Interim Operations document prepared and maintained specifically for a facility or process within a facility. Under these controls, any change in approved operations or to facilities would cause a halt in operations until it can be established that worker and public safety has not been compromised.

**Preferred Alternative: Phaseout**

**Normal Operation.** The phaseout of Pu storage at RFETS would reduce the impacts from radiological and chemical releases and exposures to levels below the No Action levels. All workers involved in the removal of Pu from RFETS would be monitored to ensure that their doses remain within acceptable levels.

**Facility Accidents.** The phaseout operation will be conducted in accordance with DOE Orders to ensure that the risk to the public of prompt fatalities due to accidents or of cancer fatalities due to operations will be minimized. For current operations in the facility that would be phased out, the safety of workers and the public from accidents is controlled by Technical Safety Requirements that are specified in SARs or Basis for Interim Operations documents that have been prepared for the facility. Prior to initiating phaseout, the potential for accidents that could impact workers and the public will be assessed and, if necessary, applicable existing safety documentation will be modified to ensure safety for workers and the public.